CLAIMS:

1. A method of processing multi-component seismic data acquired at a receiver station from seismic signals propagating in a medium, the method comprising the steps of: selecting a first portion of the seismic data; and determining a calibration filter from the first portion of the seismic data, the calibration filter being to calibrate a first component of the seismic data relative to a second component of the seismic data; wherein the step of determining the calibration filter comprises processing the data in the common shot domain.

2. A method as claimed in claim 1 and comprising applying the calibration filter to the second component of the seismic data.

3. A method as claimed in any preceding claim wherein the seismic data are obtained from seismic signals propagating in a water column.

4. A method as claimed in claim 1, 2 or 3 wherein the second component of the seismic data is pressure.

5. A method as claimed in claim 4 and comprising determining $q(f,k)P(f,k)$ in the common shot domain, where P denotes pressure, q denotes vertical slowness, f denotes frequency and k denotes horizontal wavenumber.

6. A method as claimed in claim 4 or 5 wherein the first component of the seismic data is a component of the particle motion.

7. A method as claimed in claim 6 wherein the first component of the seismic data is the vertical component of the particle motion.

8. A method as claimed in claim 3 or in any of claims 4-7 when dependent from claim 3 wherein the step of determining the calibration filter comprising determining a calibration filter that minimises the energy immediately above the base of the water

column of the down-going constituent of the first component of the seismic data for the selected portion of the seismic data.

9. A method as claimed in claim 8 and comprising determining a calibration filter that minimises the energy immediately above the base of the water column of the down-going constituent of the vertical component of the particle velocity according to

$$v_z^+(f,k) = \frac{1}{2} a(f) v_z(f,k) + \frac{q(f,k)}{2\rho} P(f,k)$$

where v_z^+ denotes the down-going constituent of the vertical component of the particle velocity, v_z denotes the acquired vertical component of the particle velocity, a(f) denotes the calibration filter, and ρ denotes the density of the water column.

10. A method as claimed in claim 3 or in any of claims 4-7 when dependent from claim 3 wherein the step of determining the calibration filter comprising determining a calibration filter that minimises the difference, after muting the direct wave, between up-going energy in the water column and down-going energy in the water column.

11. A method as claimed in claim 10 and comprising determining a calibration filter that minimises the following objective function:

$$E = \sum_{f,k} W(f,k) \left(\left| V_z^-(f,k) \right| - \left| V_z^{(r)+}(f,k) \right| \right)^2,$$

where *W(f,k)* is a weighting function, v_z^- is the up-going constituent of the vertical particle velocity, and $v_z^{(r)+}$ is the down-going constituent of the vertical particle velocity after muting of the direct wave.

12. A method of seismic surveying comprising the steps of: actuating a source of seismic energy; acquiring seismic data at a receiver station spatially separated from the source; and processing the data by a method as defined in any of claims 1 to 11.

13. A method as claimed in any preceding claim and comprising applying the calibration filter to a second portion of the seismic data acquired at the receiver station.

14. An apparatus for processing multi-component seismic data acquired at a receiver station from seismic signals propagating in a medium, the apparatus comprising: means for determining a calibration filter from a first portion of the seismic data, the calibration filter being to calibrate a first component of the seismic data relative to a second component of the seismic data; wherein the apparatus is adapted to determine the calibration filter by processing the seismic data in the common shot domain.

15. An apparatus as claimed in claim 14 and adapted to filter the second component of the seismic data in the common shot domain.

16. An apparatus as claimed in claim 15 and adapted to filter the acquired pressure seismic data in the common shot domain.

17. An apparatus as claimed in claim 16 and adapted to determine $q(f,k)P(f,k)$ in the common shot domain, where P denotes pressure, q denotes vertical slowness, f denotes frequency and k denotes horizontal wavenumber.

18. An apparatus as claimed in any of claims 14 to 17 and comprising a programmable data processor.

19. A storage medium containing a program for the data processor of an apparatus as defined in claim 18.

20. A storage medium containing a program for controlling a programmable data processor to carry out a method as defined in any of claims 1 to 13.

21. A program for controlling a computer to carry out a method as defined in any of claims 1 to 13.